

REMARKS

Currently pending claims 1-10 and 12-36 are for consideration by the Examiner.

The Examiner rejected claims 1-10 and 12-36 under 35 U.S.C. §112, second paragraph.

The Examiner rejected claims 1-3, 6, 20, 21, 23, 31, and 33 under 35 U.S.C. §102(b) as being anticipated by Ogashiwa, Australian Patent AU-B-68124/90.

The Examiner rejected claims 1-3, 6, 20, 21, 23, 35, and 36 under 35 U.S.C. §103(a) as being unpatentable over Yamamoto et al. (EP 0544915 A1, hereinafter "Yamamoto").

The Examiner rejected claim 4 under 35 U.S.C. §103(a) as being unpatentable over Yamamoto or Ogashiwa, as applied above, and in view of Gundotra et al. (US Patent 5369880, hereinafter "Gundotra").

The Examiner rejected claims 7-10, 12-19, 24-28, 30, 32, and 34 under 35 U.S.C. §103(a) as being unpatentable over Yamamoto, in view of Yamashita et al. (US Patent 6179935, hereinafter "Yamashita").

The Examiner rejected claims 5, 18, 22, and 29 under 35 U.S.C. §103(a) as being unpatentable over Yamamoto, Ogashiwa, or Yamamoto and Yamashita, in view of Behlen et al. (US Patent 5598033, hereinafter "Behlen").

Applicants respectfully traverse the §112, §102 and §103 rejections with the following arguments.

35 U.S.C. §112

The Examiner rejected claims 1-10 and 12-36 under 35 U.S.C. §112, second paragraph. The examiner alleges: "Claims 1, 7, 20, and 24 recites the limitation "consists essentially" in line 4 of each claim 1, 7, and 20 , line 6 of claim 24 and "consisting essentially" in line 6 of each claim 1, 7, and 20 , and line 8 of claim 24. It is not clear how much of other materials can be included. The specification discloses in page 16, lines 4-6 that "small or trace amounts of other metals such as, inter alia, copper, bismuth, zinc, silver, nickel" can be included but does not disclose what amount would be considered "small".... Claims 2-6, 8-10, 12-19, 21-23, 25-36 variously depend from claims 1, 7, 20, or 24 , they are rejected for the same reason."

In response, Applicants respectfully contend that the Examiner's arguments are misdirected, since claims 1, 7, 20, and 24 do not use the language "small". Moreover, the specification does not anywhere define "consisting essentially of" as meaning "small". The meaning of "consisting essentially of" is defined in MPEP 2111.03 which states: "The transitional phrase "consisting essentially of" limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristic(s)" of the claimed invention (citing *In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976)). Thus, Applicants are permitted to use "consisting essentially of" without explicitly stating in the claim how much of other materials can be included, since the definition of "consisting essentially of" in MPEP 2111.03 is clear and unambiguous.

Based on the preceding arguments, Applicants respectfully request that the 35 U.S.C. §112, second paragraph rejection of claims 1-10 and 12-36 be withdrawn.

35 U.S.C. §102

The Examiner rejected claims 1-3, 6, 20, 21, 23, 31, and 33 under 35 U.S.C. §102(b) as being anticipated by Ogashiwa, Australian Patent AU-B-68124/90.

Applicants respectfully contend that Ogashiwa does not anticipate claims 1 and 20, because Ogashiwa does not teach each and every feature of claims 1 and 20. For example, Ogashiwa does not teach "wherein the solder member consists essentially of a tin-antimony alloy, and wherein the tin-antimony alloy consists of about 3% to about 15% antimony by weight and a remainder consisting essentially of tin by weight".

The Examiner argues: "Ogashiwa discloses a method for forming an electronic structure and inherently the structure formed by the method, the method comprising the steps of providing a substrate 2a, 2; and soldering a lead-free solder member 3a to the substrate without using a joining solder to effectuate the soldering (see page 4, lines 13-25), wherein the solder member consists essentially a tin-antimony alloy, and wherein the tin-antimony alloy consists of about 3% to about 15% antimony by weight and a remainder consisting essentially of tin by weight that includes predominantly Sn and about 5 (or 3%) to about 10 % (or 15%) Sb by weight (See Summary, Tables 23 and 24, Table 25, samples 2 and 3); the examiner considers the metals other than Sn and Sb to be of small amount."

In response to the preceding argument by the Examiner, Applicants respectfully contend that every composition in Tables 23-25 of Ogashiwa having antimony between 3% and 15% includes at least 6% of metals other than antimony and tin. Those compositions in Tables 23-25 of Ogashiwa having antimony between 3% and 15%, and 6% of metals other than antimony and tin are as follows:

3% Sb, 1% Cu, 5% Pd (Table 23, line 3);
3% Sb, 1% Ni, 5% Au (Table 23, line 21);
4% Sb, 1% Ni, 5% Au (Table 23, line 22);
3% Sb, 1% Ni, 5% Pt (Table 23, line 31);
4% Sb, 1% Ni, 5% Pt (Table 23, line 32);
3% Sb, 1% Ni, 5% Pd (Table 24, line 8);
4% Sb, 1% Ni, 5% Pd (Table 24, line 9).

All other compositions in Tables 23-25 of Ogashiwa having antimony between 3% and 15%, also have more than 6% of metals other than antimony and tin. Applicants respectfully contend that compositions having antimony between 3% and 15% and include **at least 6%** of metals other than antimony and tin do not satisfy the requirement in claim 1 that "the tin-antimony alloy consists of about 3% to about 15% antimony by weight and a remainder **consisting essentially of** tin by weight" (emphasis added). Applicants maintain that 6% is too high a percent to satisfy the "consisting essentially of" language in claim 1.

Based on the preceding arguments, Applicants respectfully maintain that Ogashiwa does not anticipate claims 1 and 20, and that claims 1 and 20 are in condition for allowance. Since claims 2-6, 31, and 35 depend from claim 1, Applicants contend that claims 2-6, 31, and 35 are likewise in condition for allowance. Since claims 21-23, 33 and 36 depend from claim 20, Applicants contend that claims 21-23, 33 and 36 are likewise in condition for allowance.

35 U.S.C. §103: Yamamoto

The Examiner rejected claims 1-3, 6, 20, 21, 23, 35, and 36 under 35 U.S.C. §103(a) as being unpatentable over Yamamoto et al. (EP 0544915 A1, "Yamamoto").

Applicants respectfully contend claims 1 and 20 are not unpatentable under 35 U.S.C. §103(a) over Yamamoto, because Yamamoto does not teach or suggest each and every feature of claims 1 and 20. For example, Yamamoto does not teach or suggest "wherein the solder member consists essentially of a tin-antimony alloy, and wherein the tin-antimony alloy consists of about 3% to about 15% antimony by weight and a remainder consisting essentially of tin by weight".

The Examiner argues: "Referring to Figs. 4A-8 and related text, discloses Yamamoto discloses a method for forming an electronic structure and inherently the structure formed by the method, the method comprising the steps of providing a substrate 50; and soldering a lead-free solder member to the substrate without using a joining solder to effectuate the soldering (see page 5, lines 5-14), wherein the solder member consists essentially a tin-antimony alloy, and wherein the tin-antimony alloy consists of about 15% antimony by weight or less and a remainder consisting essentially of tin by weight (See page 7, lines 24-28). But it does not disclose expressly the claimed range. However, in the case where the claimed range "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists."

In response to the preceding argument by the Examiner, Applicants respectfully contend that the exact language in page 7, lines 24-28 of Yamamoto is: "The high-temperature solder used in the present invention **includes ... Sn-Sb solder containing 15% by weight of Sb (antimony) or less**" (emphasis added). Applicants contend that Yamamoto uses the open-ended word "includes" which does not satisfy the more limiting language of "consists essentially of" in

the feature "wherein the solder member consists essentially of a tin-antimony alloy" in claims 1 and 20. Applicants further contend that Yamamoto uses the open-ended word "containing" which does not satisfy the more limiting language of "consisting essentially of" in the feature "wherein the tin-antimony alloy consists of about 3% to about 15% antimony by weight and a remainder consisting essentially of tin by weight" in claims 1 and 20. See MPEP 2111.03, which states:

"The transitional term "comprising", which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. See, e.g., *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501, 42 USPQ2d 1608, 1613 (Fed. Cir. 1997) ("Comprising" is a term of art used in claim language which means that the named elements are essential, but other elements may be added and still form a construct within the scope of the claim.); *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 229 USPQ 805 (Fed. Cir. 1986); *In re Baxter*, 656 F.2d 679, 686, 210 USPQ 795, 803 (CCPA 1981); *Ex parte Davis*, 80 USPQ 448, 450 (Bd. App. 1948) ("comprising" leaves "the claim open for the inclusion of unspecified ingredients even in major amounts")."

Based on the preceding arguments, Applicants respectfully maintain that claims 1 and 20 are not unpatentable over Yamamoto, and that claims 1 and 20 are in condition for allowance. Since claims 2-6, 31, and 35 depend from claim 1, Applicants contend that claims 2-6, 31, and 35 are likewise in condition for allowance. Since claims 21-23, 33 and 36 depend from claim 20, Applicants contend that claims 21-23, 33 and 36 are likewise in condition for allowance.

35 U.S.C. §103: Yamamoto In View Of Yamashita

The Examiner rejected claims 7-10, 12-19, 24-28, 30, 32, and 34 under 35 U.S.C. §103(a) as being unpatentable over Yamamoto, in view of Yamashita et al. (US Patent 6179935, hereinafter "Yamashita").

Applicants respectfully contend that claims 7 and 24 are not unpatentable over Yamamoto in view of Yamashita, because Yamamoto in view of Yamashita does not teach or suggest each and every feature of claims 7 and 24. For example, Yamamoto in view of Yamashita et al. does not teach or suggest "wherein the solder member consists essentially of a tin-antimony alloy, and wherein the tin-antimony alloy consists of about 3% to about 15% antimony by weight and a remainder consisting essentially of tin by weight". Applicants' contention that claims 7 and 24 are not unpatentable over Yamamoto in view of Yamashita are based on the same arguments presented *supra* for Applicants' contention that claims 1 and 20 are not unpatentable over Yamamoto.

Based on the said arguments, Applicants respectfully maintain that claims 7 and 24 are not unpatentable over Yamamoto in view of Yamashita, and that claims 7 and 24 are in condition for allowance. Since claims 8-19 and 32 depend from claim 7, Applicants contend that claims 8-19 and 32 are likewise in condition for allowance. Since claims 25-30 and 34 depend from claim 24, Applicants contend that claims 25-30 and 34 are likewise in condition for allowance.

CONCLUSION

Based on the preceding arguments, Applicants respectfully believe that all pending claims and the entire application meet the acceptance criteria for allowance and therefore request favorable action. If the Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicants invites the Examiner to contact Applicants' representative at the telephone number listed below.

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